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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,232	10/16/2003	Shung-Huei Chang	890-007.003	8049

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EXAMINER

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/687,232

Applicant(s)

CHANG ET AL.

Examiner

Gregg Cantelmo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3-29-04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed March 29, 2004 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

2. The drawings received November 10, 2003 are acceptable for examination purposes.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-21 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "fuel" in claims 1-21 is used by the claim to mean a hydrogen fuel reactant and oxidant reactant, while the accepted meaning is "a hydrogen comprising reactant." The term is indefinite because the specification does not clearly redefine the term. The term fuel is commonly directed to

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the hydrogen comprising reactant (e.g., natural gas, methane, methanol, etc.) but is not a commonly applied term to the cathode reactant (being a source of oxygen or oxidant). Applicant is advised to amend the term "second fuel" to more accurately refer to the oxidant source.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 5-15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,465,119 (Koripella).

Koripella discloses a fuel cell and method of fabricating a fuel activation assembly for use in a fuel cell, the fuel cell comprising a first cell component for containing a first fuel component and a second cell compartment for containing a second fuel component, wherein the fuel activation assembly 16 is disposed between the first cell compartment and the second cell compartment so as to activate the first fuel component for producing protons in the first cell compartment and for channeling the protons to the second cell compartment, said method comprising the steps of: providing a substrate 14' having a plurality of apertures; and securely attaching a plurality of membrane electrode assembly segments 16 to the substrate 14' over the apertures, wherein each membrane electrode assembly segment has a first side and an opposing second side, the second side adjacent to the second cell compartment, the

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first side adjacent to the first cell compartment for activating the first fuel component in order to produce the protons and for channeling at least part of the protons from the first cell compartment to the second cell compartment via the apertures through the membrane electrode assembly segments 16 (Fig. 3 as applied to claim 1)

Koripella a first cell compartment for containing a first fuel component; a second cell component for containing a second fuel component; and a fuel activation assembly disposed between the first cell compartment and the second cell compartment, the fuel activation assembly comprising: a substrate having a plurality of apertures 14'; and a plurality of membrane electrode assembly segments 16 securely attached to the substrate 14' over the apertures, wherein each membrane electrode assembly segment 16 has a first side and an opposing second side, the second side adjacent the second cell compartment, the first side adjacent the first cell compartment for activating the first fuel component to produce protons in an activation process and for channeling at least part of the protons from the first cell compartment to the second cell compartment via the apertures through the membrane electrode assembly segments (Fig. 3 as applied to claims 5 and 12-13)

The fuel cell further comprising a first electrically conducting terminal operatively connected to the first cell compartment; and a second electrically conducting terminal operatively connected to the second cell compartment, so as to allow a current load to connect to the first and second electrically conducting terminals to use the electrical current (as applied to claim 6).

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It should be understood that while only one single fuel inlet 32 is described, that it is anticipated by this disclosure that any number of fuel inlets, more particularly, water and methanol, inlets may be included dependent upon design requirement (col. 3, ll. 60-65). Base portion 14 is typically formed of glass, plastic, silicon, ceramic, or any other suitable material, exemplary of materials having an inherent degree of resistance to the methanol/water mixture (col. 3, ll. 5-10 as applied to claim 7). The alcohol is methanol (as applied to claim 8). The cathode, second fuel, component is air (prior art claim 1 as applied to claim 9). The MEA includes a proton exchange membrane (col. 3, ll. 20-25 as applied to claims 10 and 12). Each electrode includes a carbon cloth backing, through which the respective reactant passes through to the catalyst material of each electrode and thus is exemplary of gas diffusion media (col. 5, ll. 50-55 as applied to claim 11). It should be understood, that it is anticipated that fuel cells 12 can be electrically interfaced utilizing either a series connection or a parallel connection, dependent upon the desired resultant voltage (col. 5, ll. 20-30 as applied to claims 14 and 15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koripella in view of JP 11-045729 (JP '729).

The teachings of Koripella have been discussed above with respect to the fuel cell arrangement.

Koripella does not teach of the fuel cells having a heat bonding process for sealing the fuel cell.

JP '792 discloses using hot-melt seals in PEM fuel cells to seal the reactants from one another and from external contaminants.

The motivation for using sealing the fuel cell substrate is that it improves the integrity of the seal in the microfuel cell and provides an improved seal barrier between the anode and cathode of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Koripella by providing an adhesive to the sealing of the fuel cell since it would have improved the integrity of the fuel cell seal and provided an improved seal barrier between the anode and cathode of the fuel cell.

6. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koripella in view of either U.S. Patent No. 6,960,403 (Morse) or U.S. Patent Application Publication No. 2005/0019635 (Arroyo).

The teachings of Koripella have been discussed above with respect to the fuel cell arrangement.

The fuel mixture is a mixture of methanol and water (as discussed above and applied to claim 4).

The differences between claims 3 4 and Koripella are that Koripella does not teach of using an adhesive to create a barrier (claim 3), of the adhesive layer being resistant to water and alcohol (claim 4).

Morse discloses sealing a microscale planar fuel cell between adjacent substrates (Fig. 2) wherein the sealing is provided to prevent reactant crossover between the anode and cathode. The bonding material is provided with an adhesive (col. 3, ll. 30-32). Arroyo discloses using an adhesive bonding to seal opposing base

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plates in a direct methanol fuel cell (para. [0068], [0097], [0100] and [0101]). The motivation for using an adhesive is that it improves the integrity of the seal in the microfuel cell and provides an improved seal barrier between the anode and cathode of the fuel cell.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Koripella by providing an adhesive to the sealing of the fuel cell since it would have improved the integrity of the fuel cell seal and provided an improved seal barrier between the anode and cathode of the fuel cell.

It would have further been obvious to select an adhesive material resistant to methanol and water since the fuel reactant is a mixture of such in Koripella and by selecting methanol and water resistant sealants, the seal would have improved seal integrity throughout operation of the fuel cell.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koripella in view of either DE 19624887 (DE '887) or U.S. Patent No. 6,127,058 (Pratt).

The teachings of Koripella have been discussed above with respect to the fuel cell arrangement.

Koripella does not teach of the fuel cells being connect both in parallel and in series.

DE '887 discloses that connecting plural fuel cells both in parallel and in series permits the fuel cells to more readily match required load demands. Referring now to FIG. 3, when the fuel cell 20 is laminated together, the interconnect means 26 in each of

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the current collector assemblies 21, 22 are connected to each other outside the periphery of the MEA to provide a path for electron transfer between anodes and cathodes. These connections 32, while shown as a series circuit, can also be arranged in parallel, or in a combination of series/parallel, depending on the output desired from the fuel cell (Pratt, col. 4, ll. 40-55)

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Koripella by providing a series circuit, parallel circuit, or a combination of series/parallel circuitry, depending on the output desired from the fuel cell.

8. Claims 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koripella in view of U.S. Patent No. 7,033,691 (Mardilovich).

The teachings of Koripella have been discussed above with respect to the fuel cell arrangement.

Koripella further teaches that the fuel cell design therein is provided as "battery replacements" and therefore obviously used in portable electronic devices.

Koripella does not teach of the particular load.

The use of direct methanol fuel cells in various portable electronic devices, including portable computers and PDAs is a well known power source for such devices as shown by Mardilovich (col. 1, ll. 20-40). The motivation for using fuel cells in portable computers or PDAs is that it provides the portable electronic device with a light-weight, reusable, efficient, and reliable power sources.

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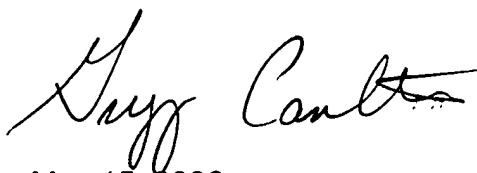
Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Koripella by selecting the load to be a portable electronic device since it would have provides a portable electronic device having an alternative power source which is light-weight, reusable and more efficient than conventional batteries.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



May 15, 2006

gc

Gregg Cantelmo
Primary Examiner
Art Unit 1745